

Medical and public health services at the 1996 Atlanta Olympic Games: an overview

Richard J Brennan, Mark E Keim, Trueman W Sharp, Scott F Wetterhall, R Joel Williams, Edward L Baker, John D Cantwell and Scott R Lillibridge

Planning for the 2000 Sydney Olympic Games may benefit from the experience of the 1996 Atlanta Olympics. Excellent health promotion and prevention activities before and during the Games resulted in fewer medical and public health problems than anticipated. Despite this, there was room for improvement in the level of communication and cooperation between the many service providers to ensure the most appropriate and efficient responses.



The 1996 summer Olympic Games in Atlanta was the largest event in sporting history. With the influx of over 10 000 athletes from 197 countries and an estimated 2.2 million visitors, there were concerns that the city's health services and infrastructure would be strained excessively. Experience at previous Olympics and other mass gatherings had shown that issues of medical care for athletes and visitors, emergency services, public health and disaster preparedness would need to be addressed.¹⁻⁶ Major anticipated medical problems included heat-related illness, foodborne and waterborne illness, and sexually transmitted disease. With 35 heads of state expected to attend, as well as many other world political and business leaders, disaster preparedness planning had to include the consequences of a terrorist attack with conventional, chemical, biological or nuclear weapons.

We review the medical and public health preparation and services provided for the Atlanta Olympics, with emphasis on aspects relevant to the forthcoming Sydney Olympics.

Medical care at the Olympic venues

Responsibility for providing medical and first aid services for

spectators and athletes was assumed by the Atlanta Committee for the Olympic Games (ACOG). Services were provided at all 35 Olympic sporting venues, at the Olympic Village (athletes' residences) and at Centennial Olympic Park (a community park open to the public). Services were staffed with the help of 4000 medical volunteers, including Red Cross personnel, emergency medical technicians, paramedics, nurses and almost 700 physicians from across the United States (US). A venue medical officer coordinated services at each site.

Separate medical services and clinics were provided for athletes and spectators. For athletes, in addition to the Polyclinic at the Olympic Village, there was a medical clinic at each sports venue, coordinated by the athlete medical director.

Medical care for spectators was provided by:

- First responders — Red Cross volunteers, trained in first aid and basic life support, and stationed in the crowd.
- Advanced life support teams — teams of two volunteers, at least one of whom was a paramedic, who could be alerted by first responders. They were able to provide advanced medical care on scene, including defibrillation and endotracheal intubation.
- First aid stations and clinics — at each venue, staffed by physicians, nurses, paramedics and emergency medical technicians. Medical care included minor suturing, short-term intravenous therapy and basic analgesia. Clinics were equipped with cardiac monitors and defibrillators with pacing capabilities to facilitate management of cardiac and other medical emergencies before hospital transfer. Not all presenting patients required physician assessment, but all those who were reviewed by a physician had a medical encounter form completed to assist with public health surveillance.

During the Olympics, more than 30 000 people sought medical assistance at first aid stations and clinics, and 10 723 were examined by physicians. The most common indication for physician examination was injury (34%); heat-related illness was diagnosed in 10%. The busiest medical facility was the Polyclinic at the Olympic Village, where 2474 Olympic staff and athletes were assessed, with many of those from other countries having routine dental and eye examinations (see Eaton et al., page 599).

Centers for Disease Control and Prevention, Atlanta, Georgia, USA.

Richard J Brennan, MPH, FACEM, Visiting Scientist, Emergency, Refugee and International Health, National Center for Environmental Health; **Scott F Wetterhall**, MD, Medical Epidemiologist, Office of Program Planning and Evaluation; **R Joel Williams**, DVM, MS, Epidemiology Intelligence Service Officer, National Center for Infectious Diseases; **Edward L Baker**, MD, Director, Public Health Practice Program Office; **Scott R Lillibridge**, MD, Associate Director, Emergency, Refugee and International Health, National Center for Environmental Health.

Division of Emergency Medicine, Emory University School of Medicine, Atlanta, Georgia, USA.

Mark E Keim, MD, Fellow in Disaster Medicine.

Headquarters, United States Marine Corps, Washington, DC, USA.

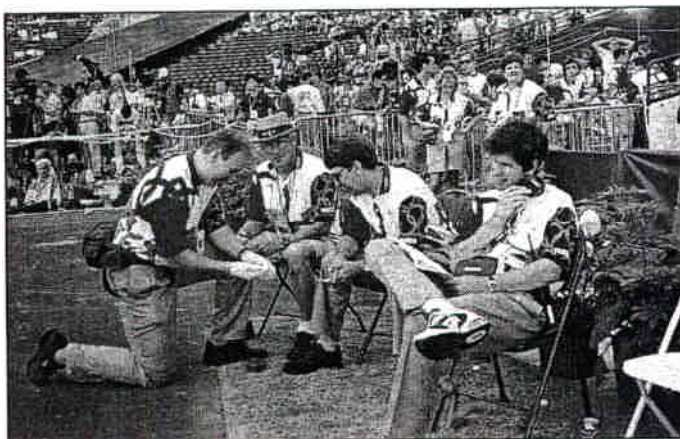
Trueman W Sharp, MD, MPH, Preventive Medicine Officer.

1996 Centennial Olympic Games, Atlanta, Georgia, USA.

John D Cantwell, MD, Chief Medical Officer.

Reprints: Dr R J Brennan, Center of Excellence in Disaster Management and Humanitarian Assistance, 1 Jarrett White Road (MCPA-DM), Honolulu, HI 96814, USA.

E-mail: brennanr@website.tamc.amedd.army.mil



Physician team stationed at the marathon. Each Olympic venue provided medical services for both athletes and spectators, including clinics, first aid stations and Red Cross volunteers stationed in the crowd.

Prehospital care

Ambulance services for patients who could not be managed at the Olympic venues were provided under agreements with ACOG by the 37 licensed emergency medical services (EMS) — private ambulance companies — that service the Atlanta metropolitan area. In addition, some emergency medical technicians used bicycles and motorised golf carts for rapid movement around heavily congested venues and pedestrian areas. A medical helicopter service was on stand-by.

Each of the 37 EMS providers in Atlanta services a different metropolitan region. To facilitate the sometimes poor communication and coordination between these providers and regions, the State Emergency Medical Services Advisory Council issued them with uniform recommendations. These included uniform operational plans and procedures developed for the Olympics, agreements on enhanced lines of communication, protocols for management of heat-related illness, and guidelines for response to a mass casualty incident.

A major issue for the emergency medical services was to provide quality care to athletes, spectators and visitors without depleting services to the general population. Most EMS providers cancelled employee leave. ACOG and the Atlanta Police Department developed a traffic plan that outlined expedient ambulance routes, and real-time traffic information was provided to the services.

During the Games, emergency medical technicians from Atlanta Fire Services (the main first responders within the City of Atlanta) responded to 2163 emergency calls, an increase of 16.2% over usual. Interestingly, average response times did not increase. Use of medical golf carts in the "Olympic Ring", where most Olympic venues were located, was very successful in overcoming the problems of traffic congestion; average response time was an impressive 2.1 minutes for the 414 calls received (Don Hiett, Atlanta Fire Department, personal communication). One patient was successfully resuscitated after a cardiac arrest.

Hospital emergency departments

Most Atlanta hospitals began serious preparation many months before the Olympics. Staff were educated on heat-

related illness, mass casualty incidents, patient overflow plans, traffic projections, and busy event days. Most medical facilities reviewed their disaster response plans and scheduled extra staff to work during the Olympic period.

To optimise coordination of emergency and hospital services in case of a disaster, a baseline survey of Atlanta hospital resources was conducted a week before the Games. This determined staffed in-patient beds, emergency department capacities and specialty services. During the Olympic period, hospitals were asked to telephone or fax information on beds and other resources to the central coordinating centre, which generated an Olympic Bed Report twice daily.

Most hospitals cooperated, with 68%–92% responding on each occasion (Ruth De Loor, RN, Area Emergency Manager, National Disaster Medical System Coordinator, Atlanta Veterans Administration Medical Center, personal communication). However, the efficiency and accuracy of this system could have been improved by computerised, real-time monitoring of bed status.

Ensuring reliable communications among EMS providers, hospitals and coordinating centres was a major consideration. Extra radios were provided to EMS workers by state and federal sources. A communications protocol was distributed to hospital emergency departments in the week before the opening ceremonies. The major means of communication between hospitals and Emergency Operations Centers were routine telephone and fax lines, but about two-thirds of hospitals also had VHF radios as a back-up.

Neither the four metropolitan nor the four non-metropolitan sentinel hospitals had a significant increase in emergency department presentations during the Olympics. The number of patients presenting with unintentional injuries and vomiting without diarrhoea increased slightly. The number seen for heat-related illness in metropolitan hospitals peaked at 18 on the second day of Olympic competition, 20 July. There were no increases in numbers of patients presenting with infectious diseases or with sexually transmitted diseases (STDs).

Olympic athletes were referred to a single hospital near the Olympic Village, Crawford Long Hospital of Emory University. During the Games, 43 sought hospital care and 22 of these required inpatient admission (see Keim and Williams, page 603).

Public health

Public health services during the Olympic Games were coordinated by the Division of Public Health within the Georgia State Department of Human Resources. Services addressed the major public health concerns of heat-related illness, infectious diseases, food and beverage safety, and environmental health. Surveillance systems were set up to detect emerging outbreaks of infectious disease and unusual disease and injury patterns, and to measure health service use during the Games.

Surveillance: Two complementary public health surveillance systems were established specifically for the Games. Surveillance inside Olympic venues was coordinated by ACOG with the assistance of the Centers for Disease Control and Prevention (CDC). Every physician encounter at Olympic venue clinics and first aid stations was documented, and records were faxed to the Olympic Medical Data Center

for compilation and analysis. Daily and cumulative summaries were submitted to the ACOG medical coordinator and to state and federal health officials. Rates of illness could be determined for each venue, as attendance figures provided denominators, allowing health and medical interventions to be targeted.

For example, the highest rates of heat-related illness were documented at the beach volleyball venue (24 cases/100 000 attendees) and the Horse Park (19.7 cases/100 000 attendees). This information allowed ACOG and public health officials to increase public awareness announcements at these venues, encouraging spectators to drink more fluids, to seek shade and to recognise the symptoms of heat-related illness.⁷

No unusual disease outbreaks or illness patterns were detected at Olympic venues.

Surveillance outside the Olympic venues was coordinated by the State Division of Public Health. The pre-existing passive system for notification of infectious diseases and other significant conditions was augmented by:

- Active surveillance of medical presentations at eight sentinel hospitals (four in metropolitan Atlanta and four in other cities hosting Olympic events), with daily data transmitted electronically to the Division of Public Health.
- Daily reports from the Georgia public health laboratory and the state's busiest private laboratory.
- Encouragement to physicians and other health care providers to report unusual medical presentations directly to the state Division of Public Health.

These data were compiled, summarised and reported daily to ACOG and to state and federal health officials.

Heat-related illness: Atlanta's hot, humid summer weather, combined with overcrowding on the streets, on public transport and at Olympic venues, made prevention of heat-related illness a major challenge of the Olympics.^{7,8} An extensive media public awareness campaign was supplemented by pamphlets sent to ticket purchasers informing them of preventive measures. The Georgia State Division of Public Health, the Red Cross and the Salvation Army combined to provide shelter, water, wide-brimmed hats, fans, sunscreen and prevention information to pedestrians along corridors to Olympic venues. In addition, water misters attached to high velocity evaporative fans were placed at 25 of the most crowded sites to help cool spectators and pedestrians. State health officials distributed guidelines on recognition and management of heat-related illness to EMS providers and hospitals.

Heat-related illness was less common than anticipated, diagnosed in only 10% of patients examined by physicians at Olympic venue clinics and first aid stations. This may have reflected the cooler than expected weather: average air temperatures and relative humidities during the 17 days of Olympic competition were 23.4°C and 83% (0700), 29.4°C and 63% (1300) and 27.7°C and 67% (1900),⁹ and the temperature range was 20°C to 37°C



Twenty-five water misters attached to high velocity fans were placed at key points around Atlanta for public use to help prevent heat-related illness, one of the major public health concerns of the Games.

(Southeast Regional Climate Center, personal communication). In addition, the impressive promotion and preventive activities probably contributed to the control of heat-related illness.

Food safety and environmental health: The enormous influx of visitors made food safety and prevention of foodborne illness critically important. About 150 food and drug inspectors from throughout Georgia and other areas of the US were employed to inspect and monitor food vendors, who were required to comply with strict state health and safety regulations and to have an official licence. General environmental health services, such as water testing, sanitation services and solid waste disposal, were augmented by local and state public health officials.

On the first day of Olympic competition, two unlicensed food vendors were detected in the Olympic Village, and were implicated in the development of diarrhoeal disease by two residents. However, food safety precautions were

in general highly successful. According to the Department of Human Resources, the Atlanta Olympic Games were the first in the modern era to have no major outbreak of foodborne disease.

A mosquito infestation at the Olympic Village was investigated by state environmental health officers and control measures recommended to ACOG.

Infectious diseases: A large international gathering such as the Olympic Games may allow intercontinental transmission of microorganisms, which may be drug-resistant.⁴ During a previous international sporting event in the US, a measles outbreak was traced to a visiting athlete.⁵ At the Atlanta Olympics, the active surveillance for unusual presentations and infectious disease outbreaks was designed to allow same-day medical and public health interventions.

In addition, physicians and public health workers initiated a safe-sex campaign to limit the spread of STDs. Posters, pamphlets and buttons in 17 languages were used to communicate a "safe sex" message, and 50 000 condoms in Olympic colours were distributed at the Polyclinic.

The surveillance system detected no outbreaks of any of the 40 diseases notifiable in the US, nor any increase in STD incidence in the Atlanta metropolitan area.

Disaster preparedness

Disaster planning was a key component of Olympic preparations. The City of Atlanta and the State of Georgia are prone to natural disasters, such as hurricanes and tornadoes; Hurricane Bertha had threatened the Georgia coast in the week before the Games, and state Disaster Medical Assistance Teams had been placed on alert.

However, of greater concern was the potential for a major terrorist attack. The recent bombings in Oklahoma City and at the World Trade Center had shown that the US was prone

to major terrorist incidents, while the 1995 sarin gas attack in Tokyo showed that terrorists had access to new weapons.

Local agencies and institutions within Atlanta worked extensively on disaster planning. As well as revising disaster plans, many medical institutions developed educational programs to address mass casualty incidents. Over 1700 emergency room staff and prehospital personnel were trained in management of patients exposed to chemical, biological or nuclear agents, and disaster drills were conducted. However, the City of Atlanta and each of the seven counties within metropolitan Atlanta had separate disaster plans, and no centralised coordinating body was established to optimise use of the limited resources.

State disaster preparedness was coordinated by the Georgia Emergency Management Agency and the Department of Human Resources. State officials, recognising they lacked the resources to deal with a major terrorist event, especially involving a chemical, biological or nuclear agent, officially requested assistance from federal agencies, including the US National Disaster Medical System.

Urban Search and Rescue teams were brought to Atlanta from around the US to assist with extrication and care of victims of, for example, a building collapse. Five-member Disaster Medical Assistance Teams were stationed at key points around the city to facilitate a rapid medical response. The Marines deployed a highly skilled 300-member Chemical-Biological Incident Response Force. Forensic and laboratory services were provided by units from the Federal Bureau of Investigation, the US Army and the US Navy, Environmental Protection Agency, and CDC. In addition, members of these units were stationed at a specially convened Science and Technology Center at CDC to provide expert public health and emergency medical, toxicological and scientific consultation.

The responsibilities of US federal government agencies in domestic disaster response are outlined in the *Federal Response Plan*.¹⁰ For the Olympic Games, a supplementary document, the *Federal Consequence Management Response Plan*,¹¹ was developed. ACOG also developed a separate medical disaster plan to address incidents within Olympic venues and the Olympic Village. If a disaster within the Olympic "fence" exceeded the capabilities of ACOG, local, state and federal resources were to be mobilised.

The bombing at Centennial Olympic Park on 27 July resulted in two deaths and 111 victims presenting to city hospitals. Most injuries were relatively minor, with only 24 victims requiring inpatient admission. The incident was handled with local resources, and the FBI was the only federal agency to respond. Although the medical care provided to the victims of the bombing was excellent, the incident demonstrated the difficulties of effecting a rapid disaster response despite extensive preparations. Coordination of EMS activities was suboptimal, as excessive numbers of ambulances were dispatched before adequate assessment of the scene, potentially depleting EMS services to other areas of the city and contributing to vehicular congestion around the scene. Fortunately, this lack of coordination had negligible effects on patient care and outcomes (Denis Lockeridge, District III EMS Co-ordinator, personal communication).



Members of the United States Marines' Chemical-Biological Incident Response Force were on hand to provide medical and security support if needed after an incident involving a chemical or biological weapon. Team members were outfitted with protective garments and self-contained breathing apparatus.

Conclusion

During the Olympics, the sheer volume of people visiting the host city poses significant challenges to medical and public health communities. Meeting these challenges requires the contributions of multiple agencies and service providers. Although there were several significant problems of communication and cooperation between providers at the Atlanta Olympics, the overall provision of medical and public health services was of the highest order. Excellent health promotion and prevention activities before and during the Games resulted in fewer medical and public health problems than had been anticipated. As Sydney prepares for the year 2000 Olympics, Australian health officials could do well to learn from the Atlanta experience.

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